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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,547	07/10/2003	Lawrence R. Plotkin	10010828-1	4281

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EXAMINER

ECHELMEYER, ALIX ELIZABETH

ART UNIT	PAPER NUMBER
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1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/617,547

Applicant(s)

PLOTKIN, LAWRENCE R.

Examiner

Alix Elizabeth Echelmeyer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18, 27-50 and 73-93 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18, 27-50 and 73-93 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to Applicant's amendments filed September 20, 2006. Claims 19-26 and 51-72 have been cancelled. Claims 73-93 have been added. Claims 1-18, 27-50 and 73-93 are pending and are rejected for the reasons given below.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-13, 27-40, 43, 44, 46-50, 76, 81, 86 and 92 are rejected under 35 U.S.C. 102(e) as being anticipated by Kindler et al. (US Patent 6,440,594).

Regarding claims 1, 2, 5, 27-29, 39, 40, 48 and 49, Kindler et al. teach a direct oxidation fuel cell system comprising a plurality of anodes, cathodes and electrolyte and a fuel reservoir. The fuel is provided to the anode by an aerosol generator, or fuel ejector, located within the anode chamber of the fuel cell. The fuel is provided as an aerosol of liquid fuel droplets suspended in a gas. The aerosol generator may use one or two fluid nozzles (abstract; Figure 1; column 1 lines 64-67; column 2 lines 1-11).

The amount of fuel delivered to the anode depends on the particular oxidation catalyst used in the anode, the permeability of the membrane, the fuel concentration in the droplets, and the temperature and pressure within the cell. The fuel amount delivered is controlled by a controller, such as a digital or analog computer (column 7 lines 62-67; column 8 lines 1-4).

Regarding claims 3, 4, 33, 34, 38, 43, 44, 46, 48 and 49, Kindler et al. teach removing a byproduct of the reaction to be returned to the cell (Figure 1), and that the fuel delivered to the electrochemical cell is provided in a stoichiometric relationship appropriate for the function of the electrochemical reaction (column 10 lines 13-32).

As for claims 6-9 and 47, Kindler et al. teach a tank for methanol that also receives the exhaust from the fuel cell (column lines 26-46). Kindler et al. do not specifically teach that the byproduct would mix with the fresh fuel, but it is the position of the examiner that this mixing would occur inherently, as gases are known to mix with each other. MPRP 2112.02

Regarding claims 10-13, 76, 81, 86 and 92, Kindler et al. teach a plurality of in situ atomizers or ejectors (column 15 lines 66-67; column 16 lines 1-10).

With regard to claims 30-32, 36, 37, and 50 Kindler et al. teach a recovery tank within the fuel cell system in addition to the tank for fresh fuel (Ref. 19 of Figure 1; column lines 26-46).

As for claims 35, Kindler et al. teach a sensor for monitoring the functions of the fuel cell. The input from the sensors is used to control the fuel delivered to the fuel cell (column 7 lines 61-67; column 8 lines 1-4).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 14-18, 41, 42 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kindler et al. in view of Takahashi (US Patent 5,746,985).

The teachings of Kindler as discussed above are incorporated herein.

Kindler et al. teach the electronically controllable drop ejection device of the instant invention but fail to teach a resistor coated with a catalytic material.

Takahashi teaches a heating resistor, excellent in heat transmission, inside a fuel-reforming device. The resistor is further embedded in a catalyst, which allows heat to be transmitted to the catalyst more efficiently, causing the reaction to start more rapidly (column 2 lines 63-67; column 3 lines 1-6).

It is taught by Takahashi that using a resistor embedded in a catalyst is desirable since it is more efficient and causes the reaction to occur more rapidly than the system of Kindler et al.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the fuel-mixing chamber of Kindler et al.

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with the resistor embedded in a catalyst of Takahashi in order to make a more efficient system in which the reaction of the fuel occurs more rapidly.

6. Claims 73-75, 78-80, 84-85, and 89-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kindler et al. as applied to claims 1, 27, 43 and 48 above, and further in view of Scheifler et al. (US Patent 6,372,483).

Kindler et al. teach a drop ejection device for providing fuel to an electrochemical cell but fail to teach that the device is an inkjet, thermal or piezoelectric drop ejection device.

Scheifler et al. teach dispensing fluids, and further teach that inkjet ejectors, such as thermal or piezoelectric ejectors are commonly used to dispense droplets of fluids (column 3 lines 37-56).

It would be advantageous to use any of an inkjet, thermal or piezoelectric drop ejection device in the fuel cell system of Kindler et al. that, as taught by Scheifler et al., are all commonly used to dispense droplets of fluid, since this variety of possible ejectors leads one to have a variety of options of ejectors to assemble the fuel cells depending on which ejectors are available or less costly.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use any of an inkjet, thermal or piezoelectric drop ejection device in the fuel cell system of Kindler et al. that, as taught by Scheifler et al., are all commonly used to dispense droplets of fluid, since this variety of possible ejectors leads

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one to have a variety of options of ejectors to assemble the fuel cells depending on which ejectors are available or less costly.

7. Claims 77, 82 and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kindler et al. as applied to claims 1, 27, 43 and 48 above, and further in view of Gore (US Pre-Grant Publication 2003/0194585).

Kindler et al. teach a drop ejection device for providing fuel to an electrochemical cell but fail to teach that the anode of the fuel cell is made of stainless steel and that the cathode is made of a transition metal or transition metal oxide.

Gore teaches an electrochemical device having a stainless steel anode and transition metal oxide cathode (abstract).

Gore further teaches that the stainless steel anode and transition metal oxide cathode create an electrochemical cell that has increased power density and higher cost effectiveness ([0004]).

It would have been desirable at the time the invention was made to make the anode of stainless steel and that the cathode of a transition metal or transition metal oxide since they create an electrochemical cell that has increased power density and higher cost effectiveness.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the anode of stainless steel and that the cathode of a transition metal or transition metal oxide since they create an electrochemical cell that has increased power density and higher cost effectiveness.

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Response to Arguments

8. Applicant's arguments have been considered but are moot in view of the new grounds of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is 571-272-1101. The examiner can normally be reached on Mon-Fri 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


SUSY TSANG-FOSTER
PRIMARY EXAMINER

Alix Elizabeth Echelmeyer